LIMITED CIRCULATION

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Agricultural Memorandum No 1017

A comparison between Accumulated Temperature at Screen height and near ground level

by

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Summary

This paper reports the results of a comparison between true Accumulated temperatures above zero measured at Screen height (1.25 m above ground level) and near ground level (0.10 m above soil surface) in a Winter Wheat crop at Oldhurst (near Wyton). The data are taken from observations recorded by a Didcot Automatic Weather station recording at 10 minute intervals.

The daily accumulated temperature at ground level is about 0.5°C less than at screen level during December 1982 and January 1983 for daily accumulated values of 4°C or more. In March 1983 the daily accumulations are usually very similar.

1. Introduction

Observations were recorded, in support of an experiment on Winter Wheat, at 10 minute intervals using a Didcot Automatic Weather Station recording on a Microdata Logger at a site at Oldhurst close to Wyton.

2. Methods

Observations were recorded using thermistors which had been checked for consistency in the Autumn and are believed to be within 0.2°C of each other (if not closer). Observations at 1.25 m above ground were made in a Didcot Screen whilst these at ground level were measured between the 2nd and 3rd saucers of a screen constructed from 4 inverted plant pot saucers (the 3 lower having a diameter of 150 mm and the top one 180 mm diameter). The "layers" of the screen were separated by 40 mm. The outside of the saucers was painted gloss white and the inside surfaces "matt black".

Daily accumulated temperatures above zero were calculated by integration of the 10-minute values.

3. Results

The attached figure gives a plot of the daily accumulated temperatues at screen level and near ground. Values are identified by month; 7 days are missing in January and 17 in February. It can be seen that for days on which the accumulated temperature exceeds about 4 degrees, values at ground level are about 0.5 degrees less than those at screen level during December 1982, and January 1983. During March 1983 there is no marked difference.

4. Discussion

Readers may consider it worth knowing of this set of data when trying to decide on how to interpret, for instance, T-sum values. However, they must note that T-sums are calculated differently to these accumulated temperature values. Nevertheless the conclusions probably apply to T-sums also. Further data are required before the results could confidently be extrapolated to other locations and other seasons.

Any comments or suggestions on this paper should be addressed to the author

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22 February 1984

ACCUMULATED TEMPERATURE ABOVE 0°C in Winter Wheat.